



This meeting will be co-sponsored
by The Electrochemical Society



10th
ABAF

BRNO 2009

**Advanced Batteries, Accumulators
and Fuel Cells**

INTERNATIONAL CONFERENCE

August 30th - September 2nd 2009

SCIENTIFIC AND SOCIAL PROGRAM

Organised by:

Department of Electrotechnology,
Faculty of Electrical Engineering and Communication,
Brno University of Technology

Institute of Inorganic Chemistry,
Academy of Science of Czech Republic, Řež near Prague

Organizing committee:

Jiří Vondrák
Marie Sedlaříková

The 10th International Conference Advanced batteries, accumulators and fuel cells will be co-sponsored by:

The Electrochemical society



AUTOLAB *Electrochemical
Instruments*



Sunday, August 30th

16:00 ÷ 20:00 **Welcome party - Registration**

Monday, August 31th

8:00 ÷ 10:00 **Registration**

10:00 **Opening remarks**

10:30 – 11:30 *D. Aurbach*
NEW DEVELOPMENT OF LITHIUM BATTERIES

11:30 – 12:00 **Lectures dealing with liquid and/or gel polymer electrolytes**
M. Sedlaříková, J. Vondrák, M. Macalik
NEWS CONCERNING GEL POLYMER ELECTROLYTES

12:00 – 13:00 **Lunchtime**

13:00 – 14:00 *Takahito Itoh, Takahiro Sakakibara, Yuki Takagi, Keita Hirai, Takahiro Uno, Masataka Kubo, and Yuichi Aihara*
SYNTHESIS AND CHARACTERISTICS OF HYPERBRANCHED POLYMER ELECTROLYTE MEMBRANES FOR HIGH TEMPERATURE FUEL CELLS

14:00 – 14:30 *S. Abbrent- Nováková, S. Khatun, S. G. Greenbaum, J. Vondrák, M. Sedlaříková.*
NMR TRANSPORT MEASUREMENTS OF PMMA/LITHIUM SALT-BASED POLYMER ELECTROLYTES

14:30 – 15:00 *J. Reiter, M. Nádherná, R. Dominko, M. Gabersček*
IONIC LIQUIDS FOR SAFER LITHIUM-ION BATTERIES – ALUMINIUM CORROSION IN TFSI-BASED IIs

15:00 – 15:30 *T. Jirák, J. Vondrák*
SPINEL STRUCTURE $\text{Li}_4\text{Ti}_5\text{O}_{12}$ AS BASED MATERIAL FOR LITHIUM-ION BATTERIES

15:30 *J. Marušinec*
BATTERIES FOR FULL ELECTRIC VEHICLES – CONNECTED WITH TEST DRIVES

17:00 **Welcome evening (sponsored by BOCHEMIE a.s.)**

Tuesday, September 1st

Further lectures connected to electrolytes and electrodes for batteries

9:00-10:00

D. Aurbach

ADVENTURES OF MAGNESIUM-BASED BATTERIES

10:00- 10:30

N. E. A. Shuhaimi, N. A. Alias, M. Z. Kufian, S. R. Majid, A. K. Arof
CHARACTERISTICS OF METHYL CELLULOSE-NH₄NO₃-PEG
ELECTROLYTE AND APPLICATION
IN FUEL CELLS

10:30 – 11:30

Poster section I.

11:30

Lunchtime

12:30

Further lectures connected to electrolytes and electrodes for batteries

12:30 – 13:00

J. Vondrák, M. Sedlaříková, M. Zatloukal
THERMAL PROPERTIES OF SULFOLANE

Physical properties of materials in batteries

13:00 – 13:30

I. Exnar, A. Kay, G. Deghenghi, T. Drezen, J. Miners
LiMnPO₄ CATHODE MATERIAL FOR HIGH PERFORMANCE Li-ION
BATTERY

13:30 – 14:00

I. Fromondi
PRESENTATION OF NOVA 1.5. SOFTWARE FOR
ELECTROCHEMICAL APPLICATIONS

14:30

Visit of the Slavkov castle , wine cellar (sponsored by Ecochemie)

Wednesday, September 2nd

Physical properties of materials in batteries

- 9:00 – 9:30 *R. Moos*
NATURAL GRAPHITE FOR BATTERY SYSTEMS AND FUEL CELLS
- 9:30 – 10:00 *N. E. A. Shuhaimi, N. A. Alias, M. Z. Kufian, S. R. Majid, A. K. Arof*
APPLICATION OF CHITOSAN/IOTA-CARRAGEENAN POLYMER
ELECTROLYTES IN ELECTRICAL DOUBLE LAYER CAPACITOR
(EDLC)

Fuel cells

- 10:00 – 10:30 *T. Okada*
STRATEGY FOR DESIGNING NON-PRECIOUS ELECTRO-
CATALYSTS FOR FUEL CELLS
- 10:30 – 11:30 **Poster section II**
- 11:30 – 12:30 **Lunchtime**
- 12:30 – 13:00 *K. Miecznikowski, A. Lewera*
RUSEX NANOPARTICLES WITH TUNGSTEN OXIDE MODIFIED
CARBON-SUPPORTS AS BIFUNCTIONAL ELECTROCATALYTIC
SYSTEMS FOR OXYGEN REDUCTION
- 13:00 – 13:30 *P. Barath, J. Tichý, V. Novák*
CONDUCTIVITY OF CARBON MATERIALS FOR ALTERNATIVE
ENERGY SOURCES

Technologies and applications

- 13:30 – 14:00 *T. Mácá, L. Nezgoda, V. Špachman, J. Vondrák, M. Sedlaříková, P. Barath, J. Vrbický, P. Špičák, T. Jirák*
UTILIZATION OF ALPHA NICKEL HYDROXIDE IN ALKALINE
ACCUMULATORS
- 14:00 – 14:30 *M. Kunovjánek, J. Vondrák, M. Sedlaříková*
ELECTROLYZER FOR HYDROGEN PRODUCTION
- 16:00 **Sight-seeing of Brno**
- 18:00 **Visit of brewery PEGAS**

The program will be adopted according to the requirements of the speakers.

List of posters – section I.

Nanosized or layered materials

1. *J. Kadlec, Z. Joska, Z. Studeny, M. Dvorak, M. Jelinek and T. Kocourek*
ELECTROCHEMICAL DEPOSITION OF HYDROXYAPATITE AND
HYDROXYAPATITE/Ag COMPOSITE COATINGS ON TITANIUM ALLOY SURFACE
2. *Z. Joska, J. Kadlec, V. Hrubý*
PLASMA NITRIDED AND SUBSEQUENTLY TiCN COATED X12CRNI 18 8 STEEL
SURFACE
3. *A. Tron, R. Apostolova, A. Baskevich, A. Nosenko, E. Shembel*
ELECTROLYTIC IRON SULFIDES COATED WITH THE FILM OF SOLID
ELECTROLYTE BASED ON $\text{Li}_2\text{O-LiF-P}_2\text{O}_5$ IN THE MODEL OF LITHIUM
ACCUMULATOR WITH LIQUID ELECTROLYTE
4. *R. Apostolova, O. Kolomojets, S. Chivikov, E. Shembel*
ELECTROLYTIC IRON SULFIDES IN MODEL OF LITHIUM - ION POWER SOURCE

Solid and polymeric conductors

5. *K.G. Khatmullina, O.V. Yarmolenko, L.M. Bogdanova*
DESIGN OF SOLID POLYMER ELECTROLYTES BASED ON
POLYESTERDIACRYLATES WITH Li^+ CONDUCTIVITY
6. *Uno, T., Sano, H., Kubo, M., Itoh, T.*
PROPERTIES OF COMPOSITE POLYMER ELECTROLYTE USING
HYPERBRANCHED POLYETHER

Intercalation materials

7. *V. Svoboda, J. Kazelle, J. Vondrák, M. Sedlaříková*
SODIUM USED INSTEAD OF LITHIUM IN THE ELECTROCHROMIC DEVICES
8. *I. Maksyuta, L. Neduzhko, V. Maslov, V. Pisny, E. Shembel*
HIGH EFFICIENCY CATHODE BASED ON LITHIUM MANGANESE SPINEL FOR
Li-ION BATTERIES
9. *M. Macalik, M. Sedlaříková, J. Vondrák*
INTERCALATION OF Li IONS INTO ELECTRODEPOSITED WO_3 FILM
10. *T. Stankulov, W. Obretenov, A. Momchilov, B. Banov, A. Trifonova*
HIGH ENERGY DENSITY SILICON-CARBON COMPOSITE FOR LIB ANODIC
APPLICATION

List of posters – section I.

Fuel cells

11. *O. Chervakov, M. Andriianova, E. Shembel, I. Maksyuta, V. Ryabenko*
THERMAL STABILITY OF PROTON-CONDUCTING MATERIALS OF THE «BASIC POLYMER»-H₃PO₄ TYPE
12. *O. Chervakov, K. Gerasymenko, Yu. Gomza, Yu. Kobelchik, I. Maksyuta, E. Shembel, V. Vereschak, A. Hlopitskiy*
PROTON CONDUCTING COMPOSITE MATERIALS BASED ON SULFONATED POLYAMIDES AND ZIRCONIUM PHOSPHATE
13. *P. Barath, T. Uhliřová, J. Reiter*
LYOTROPIC LIQUID CRYSTALS – MEDIUM FOR PREPARATION OF HIGHLY ORGANISED MESOPOROUS MATERIALS
14. *Mitsuru Higa, Mikinori Sugita, Shin-ichi Maesowa, Nobutaka Endo*
POLY(VINYL ALCOHOL) BASED POLYMER ELECTROLYTE MEMBRANES FOR PASSIVE DIRECT METHANOL FUEL CELL
15. *T. Kazda, V. Novák, P. Barath*
THE DEVELOPMENT OF ELECTRODE MATERIALS FOR PEM FUEL CELL
16. *J. Vognar, J. Vondrák, V. Novák*
RESISTIVITY MEASURING WORKPLACE FOR BULK MATERIALS

Special electrochemical components

17. *L. Skatkov, V. Gomofov, S. Deribo*
ELECTRONIC SENSOR BASED ON Nb₂O₅ ELECTROCHROMIC THIN FILMS

List of posters – section II.

Accumulators

1. *P. Špičák, P. Barath, V. Novák, J. Vondrák, J. Kazelle*
PREPARATION AND PROPERTIES OF MANGANESE DIOXIDE STUDIED BY EQCM
2. *P. Křivík*
DETERMINATION OF LEAD ACID BATTERY STATE OF CHARGE (SOC)
3. *P. Abraham, P. Bača*
MEASUREMENT OF THE POSITIVE AND NEGATIVE ELECTRODE OF LEAD-ACID ACCUMULATOR USING ELECTROCHEMICAL IMPEDANCE SPECTROSCOPY ON EXPERIMENTAL ELECTRODE WITH SYSTEM OF NON-CONTINUOUS PARALLEL RIBS
4. *P. Bača, P. Abraham*
MEASUREMENT OF THE CORROSIVE LAYER RESISTANCE OF LEAD ALLOYS USING METHOD DERIVED FROM ELECTROCHEMICAL IMPEDANCE SPECTROSCOPY
5. *A. Fedorková, R. Oriňáková, A. Oriňák, H.-D. Wiemhöfer, D. Kaniansky*
PREPARATION AND CHARACTERIZATION OF PPy/PEG-LiFePO₄ CATHODE MATERIAL FOR Li-ION BATTERIES
6. *P. Spicak, T. Maca, M. Sedlarikova, J. Vondrak, J. Kazelle*
THE LiOH AND COBALT INFLUENCE IN Ni(OH)₂
7. *J. Vrbický, J. Vondrák, M. Sedlaříková*
STABILIZATION EFFECT OF MAGNESIUM ADITIVES IN NICKEL HYDROXIDE
8. *R. Lábus, R. Bilko, P. Křivík*
TOTAL CHARGE PASSED ON THE SURFACE AND DISTRIBUTION INTERNAL RESISTANCE OF LEAD-ACID ACCUMULATOR ELECTRODES
9. *Tulibaeva, G. Z., Yarmolenko, O. V., Shestakov, A. F.*
QUANTUM-CHEMICAL MODELING OF REACTION OF GAMMA - BUTYROLACTONE DECOMPOSITION ON Li-ELECTRODE SURFACE

Methods

10. *E. Svoboda, K. Maňas, R. Dvořáková*
SURFACE TEXTURES AND THEIR ANALYSIS
11. *J. Vanek, A. Vesely, J. Stencel, J. Dolensky*
AUTOMATIC DETECTION OF DEFECT IN SOLAR CELLS
12. *A. Vesely, J. Vanek, J. Dolensky*
USING BACKLIGHTING IN THE PHOTOLUMINESCENCE IMAGING
13. *J. Dolenský, A. Veselý, J. Vaněk, J. Kazelle*
METHOD OF DETECTION MICROPLASMA IN SOLAR CELL
14. *J. Vanek, Z. Chobola, M. Lunak, J. Dolenský*
TESTING QUALITY OF NEW SOLAR CELLS DESIGNED FOR CONCENTRATORS SYSTEM BY NOISE SPECTROSCOPY

List of posters – section II.

15. *P. Fiala, Z. Szabó, Z. Roubal*
NUMERICAL MODEL LEAD-ACID ACCUMULATOR GRIDS
16. *P. Fiala, Z. Roubal*
MODELING OF AIR FLOW IN THE HEAT ACCUMULATOR LAYER
17. *P. Dvořák, P. Stejskal*
DEPOSITING OF CARBON LAYERS FOR SUPERCAPACITORS
18. *T. Knotek, J. Vondrák*
RESEARCH OF THIN Ni-Zn ALLOY
19. *K. Klosová, P. Barath, L. Trnková*
STUDY OF HYDROGEN EVOLUTION ON PIGE AND HMDE ELECTRODES

Information

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